DOCUMENT RESUME

ED 455 004 PS 029 643

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TITLE Third Graders' Self-Regulation and Self Efficacy in a Concept Formation Task: Differences between Low and High Achievers.
PUB DATE 1999-04-00
NOTE 7p.
PUB TYPE Reports - Research (143)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Cognitive Ability; Comparative Analysis; Concept Formation; Differences; *Elementary School Students; Grade 3; *High Achievement; *Low Achievement; Metacognition; Primary Education; *Self Efficacy
IDENTIFIERS Self Regulated Learning; *Self Regulation

ABSTRACT

This study explored the traditionally opposite psychological domains of cognition and emotion by investigating self-regulation and self-efficacy in third graders. The study assessed the relationship between cognitive self-regulation measurements (monitoring of time, planning, and persistence) and affective self-efficacy measurements (prediction of success and confidence in the result) in relation to school achievement (low or high) of third graders. In addition, the study analyzed the allocation of different activities of self-regulation between low and high achievers. Overall, few differences were found between high and low achievers in their self-regulation or self-efficacy (an exception was high achievers' increased attention to monitoring of time). Because high achievers performed better than low achievers on the experiment's concept-formation tasks, it was concluded that high achievers have a more realistic view of their own cognitive abilities than do low achievers. This conclusion was also supported by high achievers' greater efficiency in their use of different self-regulation activities. (EV)

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THIRD GRADERS' SELF-REGULATION AND SELF EFFICACY IN A CONCEPT FORMATION TASK: DIFFERENCES BETWEEN LOW AND HIGH ACHIEVERS

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ABSTRACT

First, this study assessed the relationship between self-efficacy measurements (prediction of success and confidence in the result) and self-regulation measurements (monitoring of time, planning, and persistence) in relation with school achievement (low, high) of third graders. Second, it analyzed the allocation of different activities of self-regulation accross school achievement (low, high) of third graders. The 20 participants consisted of third grade students who were allocated to two groups (High Grade and Low Grade). No difference were found in the self-regulation and self-efficacy measurements. However, notable difference were noted in the completion of task and the different self-regulation activities as the High Grade group completed more tasks and the Low Grade group did more self-regulation activities. It is concluded that high achievers are more able to appreciate in a realistic manner their cognitive abilities in contrary to the low achievers who presented unrealistic appreciation of their own cognitive abilities. Moreover, the high achievers are also seen as more efficient as they are more sparing of activities of self-regulation.

INTRODUCTION

Many researchers are now trying to link two traditionnaly different psychological domains (and sometimes opposite views and theories): Cognition and emotion. The former refers to concepts such as metacognition and cognitive monitoring or self-regulation, while the latter usually refers to motivation, affective needs, belief, attribution (internal or external), and self-efficacy feeling. An example of the link between cognition and emotion may be found in the following case. Children must first be motivated and willing to do a task (affective factors) before they decide to spend the necessary time and effort to exercise an adequate control over this task (cognitive factors).

This study focuses on two important aspects of cognition and emotion: self-regulation and self-efficacy. *Self-regulation*, which is often associated with cognitive monitoring, relates to different types of mental activities that an individual may trigger to control and manage his/her own thinking process. It is considered to be more or less stable, possibly verbalizable, and task or situation dependant (Lafortune & St-Pierre, 1996). Self-regulation is divided into three sub-components or strategies: *planification*, *control*, and *regulation*. Planification refers to the way individuals organize the incoming information after a previous task analysis. According to this definition, Schoenfeld (1987) found that novices spend less time than experts in planification strategies elaboration when asked to solve a mathematical problem. Control strategies allow individuals to examine and collect information about their ongoing cognitive activity. Thus, it permits to check what they are doing, to verify their progress, and to assess the relevance of their strategies as well as the results attained with these strategies (Kluwe, 1987). Finally, regulation refers to *decisions* individuals take after having made a control over their cognitive activities. More precisely, regulation relates to: (1) the sum of effort individuals decide to invest in a given task and to the way they decide to portion out this effort (regulation of capacity of processing), (2) the way to address a given content depending on its difficulty level or its importance (regulation about the content of information) or both, (3) the persistence (in duration) individuals are willing to give for a task (regulation in the intensity of processing), and (4) the speed at which individuals decide to process information (regulation in the speed of processing).

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On the other hand, self-efficacy is described as the judgment individuals have about themselves concerning their own abilities to deal with an intellectual, social, affective or even physical situation (Bandura, 1977). Another definition of self-regulation is that it is the result of a global assessment process made by individuals. This global assessment by individuals contains three main aspects: (1) the evaluation about the requirements of a given task, (2) the evaluation of their own resources, and (3) the evaluation of their own capacity to use adequately their resources for the specific task. Self-efficacy feeling is not always rational but its impact on learning may be important (Bouffard-Bouchard, Parent, & Larivée, 1993; Bouffard-Bouchard & Pinard, 1988). The question that arises here is why some students spontaneously do have adequate study behaviors and do self-regulation while others fail to do so. A part of the answer seems to lie in the affective elements that surround the cognitive activity. For example, Bouffard-Bouchard and Pinard (1988) found that the way college students perceive themselves as learners (good learners or bad learners) has an impact on self-regulation, namely persistence, and planification activities, and so eventually on their performance. According to Bouffard-Bouchard and Pinard (1988), affective factors are a prerequisite for an efficient (meta-)cognitive activity. This means that affective factors determine if an individual or a child will use or not his/her metacognitive knowledge and self-regulation strategies.

First, this study assesses the relationship between self-efficacy measurements (prediction of success and confidence in the result) and self-regulation measurements (monitoring of time, planning, and persistence) in relation with school achievement (low, high) of third graders. Second, it analyzes the allocation of different activities of self-regulation accross school achievement (low, high) of third graders.

METHODOLOGY

PARTICIPANTS

Twenty third grade children participated in this study. The children were allocated to a High Grades Group (N = 10) or a Low Grades Group (N = 10) in function of their school marks.

PROCEDURE

The participants were confronted to four similar concept-formation tasks (adapted from Bouffard-Bouchard et al., 1993). Each concept-formation task consisted to discover a specific target concept in order to replace an imaginary word (e.g., INALU) that appears seven times in a short paragraph. The sentences in the paragraph were always placed in the same order and the paragraphs were presented in the same order to the participants who had to read them. Prior to the experimental concept-formation tasks, each participant had two familiarization tasks that were similar to the other four experimental tasks. Before the reading of the first sentence in each task (familiarization and experimental), the experimenter asked the child to predict his success or failure (yes or no answer) as well as to predict the level of certainty in his/her own success on a 5-point scale. During each of the tasks, the experimenter took note of the following self-regulation measurements: (1) monitoring of time, i.e., the child is checking the time by glancing at a watch or is asking about the time remaining; (2) planning, i.e., the child is reading all seven sentences of the paragraph before attempting to solve the task (find a concept); and (3) persistence, i.e., the child is using all of the allocated time and/or accept additional time offered. After the completion of each of the tasks, the experimenter asked the child to rate its level of certainty in the success of the task on a 5-point scale (confidence in response). In addition, the whole procedure was recorded on audiotape for later codification of the activities of self-regulation by two trained research assistants.

INSTRUMENTS

The *Grid of Activities of Self-Regulation* (GASR) adapted from Bouffard-Bouchard (1987) is an evaluative grid composed of 12 differents mutually exclusive activities of self-regulation used to codify the verbatim of the participants. The categories that encompass those elements are: (1) cognitive strategies of problem-solving that pertain to words (association, characterization, exploration); (2) cognitive strategies of problem-solving that pertain to sentences (conceptualization, normalization, reasonning, signification); and (3) supervision of the problem solving process by using planning activities (work organization), control of progress toward the objective (provisional evaluation), end-task decisions (provisional withdrawal), final verification (final verification), and persistence (acceptance of overtime). The aggreement for the different GASR activities between two raters is satisfactory, percentage of aggreement = 92.2% and κ = .89.

RESULTS

GROUP DIFFERENCES IN SELF-REGULATION MEASUREMENTS

The participants from the High Grades Group (M = 1.80, SD = 0.42) employed more monitoring of time during their tasks, $F(1, 18) = 7.58$, $p = .01$, than their counterparts of the Low Grades Groups (M = 1.00, SD = 0.82). The planning activity during the execution of the tasks was not statistically different, $F(1, 18) = 1.00$, $p = .33$, between the High Grades Group (M = 1.00, SD = 0.47) and the Low Grades Group (M = 0.70, SD = 0.82). As for the persistence for using all of the allocated time during the execution of the tasks, no significant statistical difference, $F(1, 18) = 1.80$, $p = .20$, is noted between the High Grades Group (M = 0.70, SD = 0.82) and the Low Grades Group (M = 1.10, SD = 0.74). In addition, there was no statistical difference, $F(1, 18) = 0.45$, $p = .51$, between the participants of the High Grades Group (M = 0.60, SD = 0.52) and those of the Low Grades Group (M = 0.80, SD = 0.79) in acceptance of additional time offered.

GROUP DIFFERENCES IN SELF-EFFICACY MEASUREMENTS

No significant statistical group differences were noted in all three self-efficacy measurement during the execution of the tasks. More specifically, the participants of the High Grades Group (M = 3.6, SD = 0.52) were as much certain to succeed (prediction measurement) in their tasks, $F(1, 18) = 0.33$, $p = .57$, than their counterparts of the Low Grades Group (M = 3.40, SD = 0.97). In addition, both groups, High Grades Group (M = 14.80, SD = 3.97) and Low Grades Group (M = 13.90, SD = 3.32), shared similar level of certainty to succeed their tasks, $F(1, 18) = 0.30$, $p = .59$. Moreover, the level of confidence in the success following the completion of the tasks was similar, $F(1, 18) = 0.58$, $p = .46$, in the participants of the High Grades Groups (M = 17.3, SD = 3.13) and the Low Grades Group (M = 16.2, SD = 3.23).

GROUP DIFFERENCES IN THE COMPLETION OF THE TASKS

The outcome of the tasks was different in each of the groups, $F(1, 18) = 8.10$, $p = .01$, as it was noted that the High Grades Group (M = 3.00, SD = 1.25) completed with success a higher number of tasks than those completed by the Low Grades Group (M = 1.30, SD = 1.42).

GROUP DIFFERENCES IN THE ALLOCATION OF SELF-REGULATION ACTIVITIES

The percentage of allocation of the 12 different activities of self-regulation as assessed by the GASR is found to be statistically different, $\chi^2(11, N = 240) = 22.7$, $p = .02$, between the High and Low Grade groups. In addition, while their

occurence were not high, some activities were specific to a group. Indeed, as can be seen in Table 1, while normalization did not occured among the High Grade group, conceptualization, final verification , and acceptance of overtime were only found to happen in this group. In contrast, the participants of the Low Grade group did in average two to three times more activities of self-regulation related to exploration and work organization thand did those of the High Grade group. Moreover, the total number of self-regulation activities noted in the High Grade group is less than those expressed by the Low Grade group. It can also be noted from Table 1 that the activities of self-regulation with the higher occurence are those that relate to exploration, reasonning, and signification.

DISCUSSION

In the overall, little differences were found between high and low school achievers in their self-regulation during the concept-formation tasks except for the monitoring of time. Indeed, the high achievers (High Grade Group) tend to look more often to the watch and ask more often at the remaining time than do the low achievers (Low Grade Group). Such results partially confirm previous studies that indicates that good learners are more able to use self-regulation strategies such as regulation. However, the lack of difference in the other measurements of self-regulation seems to lie in the young age of participants (7-8 years). According to Piaget (1928/1969) children younger than 7 years of age are unable to check the features of their own thinking.

Moreover, no differences were found on self-efficacy measurement between both groups. Such results are an indication that high and low school achievers find themselves equally competent to succeed the proposed tasks and are also equally confident in their responses. However, the high achievers did actually perform better in the concept-formation tasks than the low achievers. Consequently, it may be concluded that the high achievers are more able to appreciate in a realistic manner their cognitive abilities in contrary to the low achievers who presented unrealistic appreciation of their own cognitive abilities.

The high achievers' appreciation of their cognitive ability could also be infered from the activities of self-regulation. The high achievers are also seen as more efficient as they are more sparing of activities of self-regulation while doing sensibly as much reasonning and signification activities than the low achievers. Indeed, as a group the high achievers do less activities of self-regulation, notably less exploration.

REFERENCES

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84,* 191-215.

Bouffard-Bouchard, T. (1987). *Auto-efficacité et autorégulation dans une tâche cognitive* [Self-efficacy and self-regulation in a cognitive task]. Unpublished doctoral dissertation, Université du Québec à Montréal, Québec, Canada.

Bouffard-Bouchard, T., Parent, S., & Larivée, S. (1993). Self-regulation on a concept-formation task among average and gifted students. *Journal of Experimental Child Psychology, 56,* 115-134.

Bouffard-Bouchard, T., & Pinard, A. (1988). Sentiment d'auto-efficacité et exercice des processus d'autorégulation chez des étudiants de niveau collegial [Self-efficacy and self-regulation among college students]. *International Journal of Psychology, 23,* 409-431.

Kluwe, R. H. (1987). Executive decisions and regulation of problems solving behavior. In F. E. Weinert & R. H. Kluwe (Eds.), *Metacognition, motivation, and understanding* (pp. 31-63). Hillsdale, NJ: Lawrence Erlbaum.

Lafortune, L. & St-Pierre, L. (1996). *L'affectivité et la métacognition dans la classe* [Affectivity and metacognition in class]. Montréal: Les Éditions Logiques.

Piaget, J. (1969). *Judgment and reasoning in the child.* London: Routledge & Kegan Paul (Original work published 1928).

Schoenfeld, A. H. (1987). What's all the fuss about metacognition? In A. H. Schoenfeld (Ed.), *Cognitive science and mathematics education.* Hillsdale, NJ: Lawrence Erlbaum.

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